IMPERIAL BUREAU OF MYCOLOGY

EMPIRE COTTON GROWING CORPORATION.

REPORT OF THE ADMINISTRATIVE COUNCIL OF THE CORPORATION ADOPTED AT THE SIXTH ANNUAL GENERAL MEETING ON MAY 26TH, 1927.

The Report on the work of the Corporation for the past year, which the Administrative Council now present to members, relates to a period during which the price of cotton fell from 10d. to a little more than 6d. a lb. While difficulties are admittedly encountered in encouraging cotton-growing in the Empire at the lower price, it is nevertheless mainly to an extension of the area from which the supply of raw cotton can be drawn that consumers can look for a stabilization of the price which is perhaps of first importance in bringing about an improvement in trade. For this reason there is especial need for the work which the Corporation are endeavouring to achieve.

It is true that in some parts of the Empire where cotton is grown by white farmers the lower price is said to be on the borderline below which it no longer pays to grow the crop. And where the growers are natives working on their own holdings and costs of production cannot therefore be determined, the fall in values has caused the price that buyers could offer to be drastically cut. In these circumstances it is not surprising that the native cultivator cannot understand these fluctuations in price; he is apt to conclude that he is being exploited by the buyer, and to cut down his acreage next year in consequence. It is possible, therefore, that the striking rate of increase of the Empire crops may not be maintained during the next year or two, but, as some compensation, the necessity for laying plans for the future very carefully has

shown up clearly wherein lie our advantages and which are our weaknesses. On the one hand, it is all-important that the quality and staple should be maintained; so long as Empire cotton generally can retain its premium on American Middling, this factor will be our most valuable asset and the ratio of Empire to American cotton it likely to increase. On the other hand, the experience of the Corporation has brought out clearly that quality alone will not suffice to establish Empire Cotton on a firm basis: two other factors are of equal importance—an increased yield per acre, and, lastly, though possibly most important of all, more and better transport facilities. The fact that the total acreage under cotton this year (and perhaps for the next year or two) may possibly show little increase may not be altogether a disadvantage from the point of view of those engaged in assisting the industry, more particularly in the three directions mentioned above. In most parts of Africa an improved seed supply, upon which the quality of the crop depends, is an urgent necessity. Unfortunately, this improvement cannot be effected rapidly, and the Corporation's scientific staff will doubtless utilize the next year or two in doing their utmost to produce and multiply a type of seed which will be both more prolific and resistant to disease than the mixed types which have been characteristic of much of the cotton from Africa in the past.

At the same time, the steps which the Government has taken in the last few years to increase the number of agricultural officers and to improve their qualifications by a course of post-graduate training will assuredly be reflected in the further and better instruction of the native in improved methods of cultivation.

Finally, although the transport problem will not be capable of rapid solution, the fact that both the Imperial and local Governments are fully alive to its importance should ensure that the methods by which facilities can be increased will receive thorough investigation and lead to some definite progress.

The results of the study that is now being carried out along all these lines should effect such economies in production that even a slight recovery in raw cotton prices should provide the stimulus necessary to enable cotton growing within the Empire to resume the uninterrupted progress which it has hitherto enjoyed.

PERSONNEL.

The Corporation have in the course of the year suffered the loss through death of two of their Vice-Presidents, Lord Emmott and Sir Frank Forbes Adam, and of two members of Council, Mr. E. Judson and Mr. H. P. M. Rae. Mr. Judson was a member of the Empire Cotton Growing Committee of the Board of Trade, on the recommendation of which the Corporation was established. He was also a member of the Executive Committee of the Corporation from its formation. The Council are glad to take this opportunity of paying this tribute to the important part played by Mr. Judson in the formation of the Corporation, and in his untiring devotion to its work. Mr. H. Boothman has been appointed a member of the Executive Committee in place of Mr. Judson. The Bombay Chamber of Commerce have nominated Mr. V. A. Grantham as a member of Council to succeed Mr. Rae. The Cotton Spinners' and Manufacturers' Association, having made a change in their representatives, the Council have welcomed Mr. F. Scarisbrick as a new member.

As regards Sub-Committees, it was with the deepest regret that the Council learned of the death of Dr. A. W. Crossley, F.R.S., Director of the British Cotton Industry Research Association, and a member of the Corporation's Research and Training Sub-Committee. Mr. F. L. Engledow, M.A., who has for several years superintended the work of those of the Corporation's post-graduate Students who have held their Studentships at Cambridge, has been appointed a member of the Research and Training Sub-Committee and of the Research Station Sub-Committee.

It was with especial pleasure that the Council were able to congratulate Sir William Himbury on his knighthood, and

Mr. W. C. Bottomley, C.M.G., on the Companionship of the Order of the Bath conferred on him last year.

Mr. H. C. Sampson, C.I.E., who recently retired from the Corporation's staff after over three years' service as their Cotton Specialist in Nyasaland, has been appointed economic botanist at Kew. His duties will include periodic visits to the Dominions and Colonies in order to maintain close co-operation with those engaged in agricultural development overseas. The Corporation wish Mr. Sampson every success in his new and important work.

FINANCE.

The Revenue and Expenditure Account and the Balance Sheet for the financial year ended March 31st, 1927, are included at the end of this Report. The total income received by the Corporation from all sources during the year amounted to £120,956, a little over £13,000 less than that received in the previous year. The income from the investments representing the Capital Grant totalled £39,992—a rise of £4,564, but the Levy brought in £73,992 only, against £94,662 in 1925/26, a drop of £20,670. It may perhaps have attracted attention that the balance in the levy account on March 31st stood at the high figure of £13,671. On February 28th the balance was, however, £187 only This substantial increase was due to the fact that over £13,000 was received during the last month of the financial year, and a part of the balance was invested in Treasury Bonds in the first week of April. Dividends from investments made from income amounted to £5,000, and Bank interest totalled some £1,400.

The Corporation record with appreciation a contribution to their funds of £500, received from the Liverpool Cotton Association. They trust that this may be only the first of similar donations from other extraneous sources, and from sections of the trade other than spinners.

Turning now to the expenditure side of the accounts, it will be seen that the year's expenditure amounted to £103,684 —some £10,400 more than the sum spent in 1925-26, leaving

an unexpended balance of some £17,000. Such sums as have not been required for immediate expenditure have been periodically invested in Treasury Bonds as funds accumulated. No new heads of expenditure appear this year, but the sections of the Report which follow, dealing with the work in each country, may be supplemented by the following financial details.

Nigeria.—Expenditure has risen from £1,420 in 1925/26 to £5,730 during the year just ended. Much of this sum represented capital expenditure covering the clearing and preliminary cultivation of some 120 acres of the seed farm, the erection of the necessary buildings, and the purchase of engines, pumps and pipes for the domestic water supply.

South Africa.—About £1,200 was spent in the Union and in Swaziland in excess of expenditure in 1925/26. A certain amount of equipment has been purchased, a staff house bought in Barberton, and an additional officer appointed at Candover.

West Indies.—The Experiment Station in St. Vincent was closed down soon after work had been commenced on the Research Station in Trinidad. Expenditure in St. Vincent sank, therefore, to £228, no payment having been made under this head after the middle of July.

Uganda.—Three of the four supernumerary officers attached to the Department of Agriculture were absorbed by the Department last year, and the fourth, Mr. Hopkins, accepted the post of Government Mycologist in Southern Rhodesia in September last. £145 only was expended in this Protectorate, therefore, representing mainly Mr. Hopkins' salary for the first six months of this year, less the contributions made by the Corporation on account of Mr. Hopkins' pension, which were refunded on his transfer.

Legal Expenses and Accountancy Charges.—The expenditure under this head amounted to £680. £400 of this represented legal costs in connection with the appeal before the Special Commissioners for Income Tax heard in April, 1926. This claim, based on a request for the refund of tax paid

during the three financial years 1922/25, sought to establish that the Corporation was exempt from the payment of tax upon the income from investments; the levy is not taxable under the terms of the Cotton Industry Act. The claim was allowed by the Special Commissioners, who found that the Corporation had been established for charitable purposes only within the meaning of the Act. It is understood, however, that the Inland Revenue authorities will appeal against the decision, and the Special Commissioners have accordingly stated a case for the opinion of the High Court. The sums paid in Income Tax, amounting to £35,552, were refunded to the Corporation and have been placed on special deposit at the Bank pending the hearing of the appeal.

INDIA.

The Cotton Transport Act, which was passed in 1923 by the Indian Legislature, aims at preventing the mixing of short and long staple cotton in India. It enables Local Governments to notify areas in which long staple cotton is grown, and to prohibit the import of short staple cotton into such areas. During 1926, the Cotton Transport Act was in force in six zones of the Bombay Presidency and in three zones of the Madras Presidency. The Baroda State has enforced a cotton transport law on the same lines as the British Indian Act, while the Rajpipla State has, by special ordinance, made it illegal to sow short staple cotton in any part of the State. The effects of this legislation are satisfactory, and considerable improvement has resulted in the condition in which long staple cotton is marketed from the notified areas.

The Cotton Ginning and Pressing Factories Act of 1925 provides for the marking of bales to indicate the factory where they were pressed. It also enables Local Governments to prescribe standard weights to be used at ginning and pressing factories within its jurisdiction. Finally, it provides for the enforcement of structural requirements for ginning and pressing factories, with a view to ensure cleanliness of handling.

The Local Governments chiefly interested in the production of cotton have taken action under this Act, the working of which was satisfactory during 1926. Moreover, under Section 14 of the Act, any purchaser can now require that only bales marked in accordance with the Act are a fair tender in fulfilment of a contract, and the East India Cotton Association Limited have introduced a By-Law requiring all bales to be so marked in order to fulfil the requirements of a fair tender in Bombay.

Special measures have been taken under the Destructive Insects and Pests Act to guard against the spread of cotton pests in India. American cotton must be fumigated before importation.

The Indian Central Cotton Committee took an active part in pressing for the adoption of the above legislative enactments. It has also interested itself in the improvement of marketing conditions in the principal Indian cotton markets. Its technological laboratory was completed in September, 1925, and has done excellent work throughout the year. In regard to agricultural research, the policy of the Committee is to promote cotton research in India, partly by grants-in-aid to provincial agricultural departments and other institutions, and partly by the creation of research studentships. The new Institute of Plant Industry at Indore receives a subsidy from the Indian Central Cotton Committee, and has adopted a definite cotton research programme.

The following table is of interest as showing the success that has rewarded the efforts of the Indian Central Cotton Committee to promote the growth of improved cottons of a longer staple than that which formerly characterised Indian cottons:—

	Average of seasons 1915/16, 1916/17 and 1917/18. Bales.	Season 1925/26. Bales.	Per cent. Increase.
Short staple (under $\frac{7}{8}$ in.) ...	2,999,000	3,893,000	29·8
Long staple ($\frac{7}{8}$ in. and over)	1,161,000	2,145,000	84·8

The final official forecast of the Indian cotton crop shows a total area of 25,006,000 acres under cotton in India, and an output of 4,952,000 bales. These figures show a considerable reduction on last year's cultivation of 28,491,000 acres, with an output of 6,038,000 bales. Both in Bombay and in Madras weather conditions were unfavourable to the crop. In the irrigated areas the output was normal, but in the unirrigated areas the sowings were retarded by the deficiency of early rainfall and a shortage of rain during October.

AUSTRALIA.

The climatic conditions in Queensland were decidedly unfavourable in the season 1925-26. The spring rains were very poor, and up to December the whole country suffered from drought. Mr. W. G. Wells, the Queensland Government's Cotton Specialist, reports that in these conditions the value of the Experiment Station at Biloela, to the maintenance of which the Corporation make an annual grant, has been fully demonstrated. By employing careful methods of preparation of the seed bed and of cultivating the crop, a good type of plant, though somewhat stunted, has been developed in spite of the severe drought. These improved cultural methods are being gradually taken up by the farmers as a result of demonstrations given at the farm, and Mr. Wells confidently hopes that the general standard of cultivation in all areas will be raised in consequence.

The general outline of the experiments at Biloela is the same as that laid down by Mr. Evans, the Cotton Specialist formerly attached by the Corporation to the Queensland Government, while new problems are also being studied. Some new land has been brought under cultivation and is proving uniform and otherwise admirably suited to experimental work. A detailed account of the work of the Station last season appeared in the volume entitled " Reports received from Experiment Stations, 1925-26," recently issued by the Corporation. It was originally intended to establish similar stations in other parts of Queensland, but it has unfortunately not been possible to find a

suitable staff with the necessary qualifications and experience to equip them.

Mr. Ballard completes next July his tour of service of over three years in Queensland as Cotton Entomologist attached by the Corporation to the Commonwealth Government. His experiments last season successfully demonstrated the protection afforded to cotton against the maize grub by a trap crop of maize planted round the cotton, and cut down when the maize grub population on it is at a maximum. The cotton at Biloela protected in this way suffered but little, whereas a neighbouring plot of 30 acres, which was unprotected, lost nearly all the first squares owing to the attack of the grub. The maize, which has to be cut green, is put into a stack silo, thus providing a reserve of fodder for the farmer's dairy herd. This season Mr. Ballard hoped to continue his work on the control of the Stainer (Dysdercus), which was scarce last year owing to the drought; probably, however, similar conditions this year have hampered this investigation.

The Commonwealth Government have now replaced the former scale of guaranteed prices by a bounty on seed cotton delivered at the ginnery amounting to 1½d. per pound on higher grades, and ¾d. per pound on lower grades. The total amount of the bounty payable in any one year is limited to £120,000.

Latest advices from Queensland are to the effect that planting conditions were unfavourable in September to November, which are the best months for planting. Since December the country has experienced the first wet season since the revival of the cotton-growing industry. These circumstances have combined to make it more than usually difficult to forecast the total crop with any accuracy.

South Africa.

In last year's Report reference was made to the abnormally heavy rains of 1924-25. In many parts adverse climatic conditions of the opposite kind characterised the season 1925-26,

when droughty conditions prevailed until February. On the whole, Rustenberg and the middle veldt generally fared better than Zululand and Natal, and it is satisfactory to record that the total crop showed a slight increase on that of the previous season, though it was smaller than had been hoped from the acreage planted. The weather this season has again been unfavourable. It would appear that the worst drought for many years has affected many parts of the country; in some districts no rain fell from the planting season until early in February, and the outlook for all crops in those districts was generally unfavourable. At Barberton, where the Corporation's plant breeder is at work, it is feared that the drought may impede the multiplication of his jassid-resistant strain, to which reference was made in last year's Report, though the latest advices state that rain fell in satisfactory amounts at the end of February; this may, however, be too late to bring on such of the plants as are really backward. A note of optimism may be sounded in recording the extraordinary manner in which cotton crops have survived conditions that have killed out others less adaptable. The total production will be smaller than was hoped, but it is likely that the reputation of cotton as a hardy crop will be enhanced as a result of this season's experience.

The report from the Experiment Station in the Candover area is that in the Magut valleys the crop is somewhat patchy as a result of local hail storms and drought. The later plantings have experienced fair rains, however, and promise satisfactory yields. The red bollworm was severe in November and December, but later infestations have been comparatively mild; and the late February rains have brought on a good top crop.

In the neighbouring Transvaal valleys conditions have been more favourable, but attacks of jassid will reduce the yield considerably. The Lebombo Flats area has suffered severely from drought, and in Northern Zululand the crop will be late.

The Empangeni, Zululand, district, however, has had the best year on record. Picking is already in full swing, and reports in the press state that the crop is a record, both in quality and quantity, while no serious pest attacks have been reported.

In their last Quarterly Report the Executive referred to the results so far achieved in South Africa as having been disappointing, and it appears from the South African press that this comment may have been misunderstood as constituting a criticism on the admirable technical work that has been accomplished by Mr. Milligan and his staff. The Council would like to take this earliest opportunity of clearing up any misapprehension on this score. In the face of adverse climatic conditions, the experimental results already obtained are remarkable both in their technique, and in their significance as indicating the directions from which the solution of problems such as a supply of seed of a jassid-resistant strain and the control of red bollworm may be expected. The disappointment felt by the Executive was in connection with the output of cotton from South Africa in the last three seasons. In this respect they only share the feelings of the farmers themselves, who took up the crop with great enthusiasm, but, owing to inclement seasons, have had to accept each year yields greatly inferior to those on which they felt that they could confidently rely.

Having regard to all the circumstances, the Executive decided that it would be advantageous if the Director were personally to investigate and report to them on the whole situation. Sir James Currie accordingly sailed for South Africa on March 18th. He was accompanied by Mr. J. S. Addison and by Mr. H. C. Jefferys, formerly of the State Domains in Egypt, and later manager of the Sudan Plantations Syndicate's Seed Farm in the Gezira. Economic conditions in South Africa are naturally wholly different from those existing in areas where cotton is grown by native cultivators. The fall in

prices will inevitably seriously affect those plantation companies and ginneries in which the Corporation are interested. The Directors' report will, therefore, be especially valuable at this time as a commentary on the general prospects of cotton in South Africa. If, as is hoped, the farmers remain of the opinion that cotton is a profitable crop to include in their general rotation, in spite of their experience of three difficult seasons in succession and a heavy fall in prices, it may be confidently anticipated that the crop will become a permanent feature of South African agriculture in those large parts of the Union which are normally suitable. Probably the chief need is the provision of a pure line of seed, and, moreover, so far as the low veldt is concerned, one that will be resistant to jassid. The account of Mr. Parnell's work in this direction in the "Reports from Experimental Stations," recently published, gives ground for hoping that the solution of this problem may be within sight.

The other chief pest in South Africa is the red bollworm, which has been responsible for the loss of a great deal of cotton in the past. The work of the Corporation's staff under the direction of Mr. Milligan in controlling this pest has this year achieved important results. A short time ago Mr. King, the Corporation's Cotton Entomologist in Nyasaland, published a paper on the trapping of bollworm moths on cotton plants in the field. Experiments on these lines have been carried out on the property of the Spelonken Cotton Syndicate by the Corporation's staff in South Africa. The value of a trap crop of ratooned cotton has been fully established. The earliest emerging moths and the main emergence which follows later have laid their eggs on the crop, and these are destroyed when the trap crop is stripped. Moreover, it has been found comparatively easy to catch the moths themselves also on the trap crop. Mr. Milligan hopes to be able to work out a practicable system of trapping on these lines, which should do much to reduce the bollworm infestation. This work carried out by the Corporation's staff, coupled with the similar experiments conducted by Mr. Ballard in Australia

referred to above, constitute important steps in the control of cotton pests in the field.

The experimental work carried out by Mr. Parsons at Candover is described in detail in the "Reports from Experiment Stations." A new and more suitable piece of ground for the experimental farm has now been taken over, and Mr. E. M. Keatinge has been appointed as Assistant to Mr. Parsons.

Arrangements are being made during the Director's visit to South Africa to hold a conference at Barberton of the Corporation's officers in South Africa, Rhodesia and Nyasaland. Members of the staff will thus be brought into closer touch with one another, and will have an opportunity of discussing their individual problems, and to compare notes on the methods by which they are attacking them. It is also hoped that some steps may be possible to arrive at a partial standardisation of the lay-out of field experiments whereby greater uniformity in results may be secured and comparisons rendered easier and more accurate.

Mr. G. C. Ullyett has been appointed Assistant Entomologist in place of Mr. C. L. Chapman.

Swaziland.

Mr. R. C. Wood, the Corporation's officer in Swaziland, reported that the crop of 1925-26 was only fair in quality, chiefly on account of the lack of rain. In general, good farming produced a fair crop, and the prevailing conditions emphasised the necessity for a thorough preparation of the ground and intelligent cultivation if the yield is to be raised to a satisfactory level. Much of the cotton that came in towards the end of the season was badly stained.

As regards the experimental work, Mr. Wood carried out in particular experiments on the best time of planting, the optimum distance of spacing, and the value of manuring. Details are given in the volume of collected reports from

experiment stations. In addition to the headquarters station at Bremersdorp, Mr. Wood is arranging for plot experiments to be carried out on farmers' fields in a chain of sub-stations. This enables the results to be ascertained for each separate area and correlated with one another in the light of the meteorological data which are collected.

The chief insect pests are stainers and red bollworm. Mr. Wood is hopeful that a rigorous close season, enforceable by law, would be effective in limiting the ravages of these pests. He is also carrying out an investigation into the alternative host plants of the stainers. As regards jassid, selection of a resistant variety is going on, and Mr. Wood is also multiplying seed of a resistant variety received from Mr. Parnell, in Barberton.

Both from the point of view of keeping insects under control, and in the interests of good farming generally, a proper rotation of crops is necessary, and Mr. Wood has sent home certain varieties of oil seeds, which have been examined at the Imperial Institute, with a view to ascertaining their value and the possible markets for them. It is hoped by such means to arrive at a rotation that will be suitable for cotton and will also in itself be a profitable crop to the farmer.

This season (1926-27), notwithstanding the inadequate rains, cotton has put up an excellent fight, and has thoroughly shown its value as a drought-resisting rotation crop. Such rain as has been received has been extremely local.

It is satisfactory to be able to report that the multiplication and trial plots of the jassid-proof selections from Barberton are in all cases doing well, and will not only indicate which strains are likely to succeed, but will also provide a fair quantity of seed of the strains thus chosen. Though this will, it is hoped, largely solve the jassid question, the red bollworm is a most serious pest, and this year has taken a very heavy toll in certain areas, where it has not been severe before. It is unfortunate that the Administration has decided not to enforce the " close period " legislation passed only last year.

The area will be considerably below that of last year, and is almost entirely grown by plantation companies; the private farmer has this year put very little land to this crop.

Southern Rhodesia.

An account of the work done at the Experiment Station, Gatooma, by the Corporation's staff, has already appeared in the collected reports received from Experiment Stations, together with a covering note by Mr. Cameron, the Corporation's Senior Officer in the country. Mr. Hamilton, who was in charge of the work at Gatooma, has been transferred to Barberton, in the Transvaal, where he is working under Mr. Parnell. Mr. Peat is now in charge at Gatooma, and Mr. A. H. McKinstry has been appointed as his Assistant.

The development of the crop throughout Southern Rhodesia was hampered last season (1925-26) by the lateness of the arrival of sufficient rain for planting, followed by a rather abnormally wet growing period with heavy showers in March. The result was that the bolls failed to open properly, Moreover, the crop suffered severely from red bollworm, and particularly from stainers. The total production thus amounted to 6,803 bales of 400 lbs., as against 12,500 estimated early in the season. The fall in prices has caused some reduction in acreage this season, but Mr. Cameron reports that cotton is steadily establishing itself as a rotational crop in the three principal districts which are suitable for it, viz.: Hartley, Lomagundi, and Mazoe. He states that there is ample evidence that the yield from maize grown on land that has previously been under cotton shows a marked increase over the normal yield, and for this reason cotton is favoured as a rotation crop, apart from its own value.

The impetus given to tobacco growing as a result of the Imperial preference is diverting the energies of farmers which would otherwise have been given to cotton. This is all to the good, as it means better land for cotton at a later date when the crop is more in demand. It may be assumed that where

cotton has been planted this year, it has been put in chiefly as a rotation crop or soil renovator, and farmers generally are not expecting much from it as a money crop at present prices.

It appears that the chief need is better seed, and the staff at Gatooma are concentrating on breeding by selection an early maturing strain that shall be resistant to the chief pests and adapted to the climate. Meanwhile the Department of Agriculture have organized through Mr. Cameron a system whereby seed approved by the Government staff for sowing purposes from specially selected crops is sealed at the ginneries after it has been passed as approved. It is a condition of approval that the owner shall undertake to sell it for not more than 3d. per pound. It is hoped that the quality of seed sown may be somewhat improved in this way until the plant breeding section have had time to isolate and multiply a suitable strain.

This season (1926-27) the weather on the whole has been favourable; the rains were late in arriving and were followed by a drought lasting three or four weeks, which has affected most crops, but the cotton stood up to it well, and this has impressed farmers with the necessity of growing a certain amount of cotton as an insurance against drought. By the end of the first week in March the prospects were reported to be fair to good; bollworm and stainer infestation, so far, has been slight. At the Cotton Breeding Station at Gatooma the plots were then looking well, and the indications of obtaining an early maturing and heavily yielding variety were distinctly promising.

Northern Rhodesia.

It was mentioned in the corresponding report last year that Mr. Milligan had arranged to pay a visit to Northern Rhodesia. The Government have acted promptly on the report which Mr. Milligan submitted as a result of that visit. He suggested that an agricultural station should be established at Mazabuka, some 180 miles North-East of Livingstone, to

serve as a headquarters for the Western farming area. The finance of this proposal is being arranged by the Government, who have selected Mr. McEwen, formerly a member of the Corporation's staff in Nyasaland, as their agricultural research officer for the Station. The Government have also asked the Corporation to assist them by providing half the salaries of additional agricultural officers for the East Luangwa district and the area immediately to the South of Lake Tanganyika respectively. The difficulty of finding suitably qualified men for these posts has not yet been overcome, but the Corporation have expressed their willingness to assist in the manner suggested.

It was reported last year that the Corporation had guaranteed a maximum of £20,000 to form part of a fund of £40,000 to assist farmers who were in difficulties owing to the failure of the cotton crop of 1924-25 on account of the unprecedently wet season. The balance is provided by the local Government. The Committee appointed by the Government to administer this fund, after investigating the claims put forward for assistance, felt justified in advancing a total of £9,500 only during the 1925-26 season, the Corporation's share of which, therefore, amounted to £4,750. During the season the country suffered from drought, and the Assistance Committee accordingly recommended that further advances up to £10,000 should be made available during the 1926-27 season, in view of the pressing need of further assistance and the fact that less than one-quarter of the original sum allocated had been advanced. They suggested, however, that no individual advance should exceed a sum representing the cost of producing and harvesting 50 acres of cotton; to this the Corporation agreed. Even if the whole of the sum allocated for the 1926-27 season were to be advanced, the total loans would amount to less than half the original sum authorised. The latest report received from the Northern Rhodesian Government shows that although some advances were made on account of the season now current, repayments of loans made during 1925-26 had reduced

the total sum advanced during the two seasons to £7,488. The Corporation's share amounts, therefore, at present to £3,744.

Here, as in Southern Rhodesia, the beneficial effect has been noted on the yield of mealies from ground which was under cotton in a previous year. This fact will tend to establish cotton as a crop in the general agricultural rotation, but an improved seed supply would appear to be necessary before satisfactory yields of cotton can be assured. Doubtless experiments with this end in view will be carried out next season at the new experiment station at Mazabuka.

The climatic conditions this season have been better than those experienced last year, and in March the appearance of the cotton was satisfactory, though rather backward on account of excessive rain which fell just after planting. No pest of any consequence had then appeared, and reasonable hopes were being entertained that the area reduced in accordance with the recommendations made by Mr. Milligan and by the Corporation's cotton specialist, Mr. Salter, would give a satisfactory yield.

The Anglo-Egyptian Sudan.

The season under review saw cotton cultivated on over 80,000 feddans in the Gezira, and a crop of 384,106 kantars, or approximately 94,000 bales of 400 lbs. While this large yield is very satisfactory, it was due in some respects to a combination of favourable circumstances, and the Chairman of the Sudan Plantations Syndicate warned their shareholders that it was not a result on which calculation of future prospects should be based. However, this season more than 100,000 feddans are under cotton, and it is understood that at the time when this report was written (March), the prospect of a yield approximating to last year's was not unpromising. Steps are being taken to extend the canalized area in the Gezira, and up to another 150,000 feddans may thus be brought under cultivation.

On the recommendation of the London Committee for the co-ordination of agricultural research in the Sudan, the Corporation agreed to provide an additional chemist for work in the Gezira for a period of three years. Mr. R. Peto was appointed to this post, and he took up his duties in January last.

Gratifying progress is being made with the extension of rain-grown cotton in the South. Transport problems undoubtedly present a difficulty, but the Government are investigating these closely, and it is hoped that satisfactory arrangements will be made. Meanwhile, the Corporation and the British Cotton Growing Association are discussing with the Government the provision of adequate ginning and marketing facilities.

East Africa.

Mention was made last year of the Agricultural, Cotton and Entomological Conference which had been originally suggested by Mr. Sampson, then the Corporation's cotton specialist in Nyasaland. The Conference was held in Nairobi in August last, and was attended by officers nominated by the East African Dependencies, by South Africa, Southern Rhodesia, Portuguese East Africa and Italian Somaliland, as well as by six representatives of the Corporation.

The Corporation's officers who were present have expressed their appreciation of the opportunity thus afforded them of discussing their problems with their colleagues engaged on similar work in other countries, and their opinion that their work will benefit thereby. It is hoped that the Conference may be the means of bringing about collaboration of workers engaged on similar problems in different parts of Africa. Unfortunately, the official report of the Conference had still not been received when this report was written. When the detailed recommendations are to hand, any action by the Corporation which may be suggested will be most carefully considered.

It may be of interest to members of the Corporation to know that the Colonial Office has appointed Mr. W. Nowell, formerly, Assistant Director of Agriculture, Trinidad, and a member of the Advisory Committee on the Corporation's Research Station there, to be Director of the Amani Research Institute in Tanganyika Territory. The activities of the Institute will be primarily concerned with fundamental research work designed to supplement the work of the scientific staffs attached to the Agricultural Departments in the several East African Dependencies.

Uganda.

The fall in the price of cotton has naturally affected the economic position in Uganda. Last year the average price paid to natives was 18 cents a pound of seed cotton, whereas this year it is understood that prices mostly ranged from 10 to 12 cents. In these circumstances the Government and the commercial interests concerned have all made sacrifices in order that as high a price as possible may be paid to the native, and that he may be thereby encouraged to maintain his enthusiasm for cotton, in spite of a fall in the price which he receives for his product, which may appear to him to be too heavy. The Government have replaced the cotton tax at a flat rate by a tax on a sliding scale fixed in advance each December, and based on the price of June Futures for Middling American. The flat rate of tax was 5 cents a pound of lint; with June Futures between 6d. and 7d. last December, the tax on the sliding scale will amount this season to two cents a pound. The Kenya-Uganda railway have reduced by 25 per cent. their freights for this season on lint and seed, while it is understood that the steamship companies have reduced their charges for freight rate on cotton by 20 per cent. It has further been reported that in some cases the staff of certain companies operating in Uganda have voluntarily offered reductions in their remuneration this season. In spite of the steps that have been taken, a rather smaller acreage was planted, however, and an unofficial estimate of the crop which has appeared in the Press is 130,000 bales.

It is gratifying that the new railway facilities are developing, and it is announced that the new main line from the coast will be opened as far as Tororo in July next. It is understood that a scheme of port development at Kilindini is under consideration, and the erection of more warehouse accommodation has been decided upon. A new deep-water berth has already been completed.

Nyasaland.

An extensive report on the work carried out at the Corporation's experiment station at Makwapala, and at the two sub-stations that were opened at Port Herald and Liwonde, appears in the collected reports received from experiment stations, 1925-26. Little remains, therefore, to be added here regarding this part of the Corporation's work in Nyasaland.

An interesting article on cotton production in Nyasaland, written by Mr. C. Ponsonby, appeared in the October issue of the *Review*, and in the same issue Mr. King, the Corporation's Entomologist, published a short note on the red bollworm. Mr. King arrived in this country on leave at the end of May, and sailed again for Nyasaland early in September, in order to arrive in good time for the planting season.

Mr. Ducker attended the Conference at Nairobi, and reports that he found this opportunity of an exchange of ideas with the representatives of the various colonies, and with other members of the Corporation's staff who were present, to be extremely valuable. It was decided to transfer Mr. McEwen to Northern Rhodesia, and one of the Corporation's students, Mr. Lochrie, who completed his training in Trinidad in July last, was therefore appointed to Nyasaland, and arrived in Zomba in January last. Mr. Moffatt, one of this year's students, is spending his studentship year under Mr. Ducker, after which he hopes to secure an appointment under the Northern Rhodesian Government.

An important part of the work at Makwapala during the last few seasons has consisted of experiments with a number of crops that seemed suitable as rotational crops for cotton. Samples of several varieties of millet, beans, fibres, and oil seeds were sent home, and Mr. Sampson has been engaged upon investigations into the question of marketing such products to the best advantage. His report, embodying the results of this inquiry, including a most encouraging report by a prominent fibre merchant on the samples of jute and other fibres grown as rotation crops on the Corporation's experiment station in Nyasaland has just been issued. It is believed that this will prove of value to all the East African Dependencies and possibly to some of the other Colonies.

Up to the present it has only been economically possible to export from Nyasaland such products as cotton, tobacco and tea, which command comparatively high prices. This is largely due to the high cost of freight to Beira; all goods have to be unloaded on the North bank of the Zambesi and ferried across, and then reloaded on to railway trucks. The East African Guaranteed Loan Committee very carefully considered the question of a bridge over the Zambesi, but did not feel that the expense of building a bridge was immediately justified on the evidence before them. They recommended *inter alia* that a thorough investigation should first be made into the productive capabilities of the Protectorate, and an estimate furnished of the increased export trade that could be anticipated if the bridge and an extension of the Shire Highlands railway were completed. Further information is now being gathered on these points by the Colonial Office.

Tanganyika Territory.

The Director of Agriculture estimates the crop harvested in 1926 at 24,550 bales, a figure which shows an increase over the 1925 crop of slightly under 3,000 bales. The returns would apparently have been greater had it not been for the drop in prices, for the Agricultural Department report that owing to

low prices much of the cotton at the end of the season was not picked, which was all the more regrettable, in view of the good outturn of high grade cotton produced by the favourable season.

The Department of Agriculture have taken full advantage of the Corporation's offer to arrange for the conduct of spinning tests, a number of samples having been sent both from the Mpanganya experiment station and from the commercial crop in different districts.

The Department of Agriculture report that the seed of what has proved to be the best of the strains raised by Mr. Wood, when he was serving in Tanganyika as the Corporation's cotton specialist, was multiplied up to $8\frac{1}{4}$ tons in 1926, from which a quantity sufficient for the needs of the whole Rufiji District is expected to be raised this season.

Nigeria.

In the Director of Agriculture's report for the year ended 30th September, 1926, it is announced that the total amount of cotton purchased for export reached the satisfactory total of 47,909 bales of 400 pounds. Progress is being made with the extension of a grading system in the Southern Province, where it was introduced with considerable hesitation; and it is satisfactory to find that the purchases have not declined in spite of a fall in price.

Mention was made last year of experiments which were being conducted by the Agricultural Department in the development of a variety of native cotton in the Southern Province. Spinning tests which were carried out indicated that the appearance of these cottons was superior to their behaviour on spinning, and that they could not be successfully spun into 60s carded yarn. The Agricultural Department are carrying out further selection work on these cottons this season.

The Corporation's seed farm at Daudawa was started in January, 1926, and 120 acres were under cultivation during the season 1926-27, of which 40 acres were under cotton. Apart from one plot which was sown late, and on which the results were expected to be bad, the yield per acre was 282 lbs. of seed cotton. In view of the facts that the harmattan was exceptionally severe and early, and that, since this is the first year of cultivation, the soil was consequently unaerated, this result is distinctly promising, and Mr. Dawson Shepherd is very hopeful regarding the future.

Mr. Faulkner, Director of Agriculture, has reported in the highest terms on the work done on the farm, and of the economical manner in which it has been carried out. A second dwelling-house is now being built, and in the course of a few months it is hoped that a piped water supply will be available.

Up to the present no attempt has been made to start the co-operative scheme referred to in the Report submitted at this meeting last year. Farmers are conservative all the world over, and Nigerian farmers are no exception to the rule. It is considered that one or two co-operators will join the farm during the coming season, and that they will be quite sufficient for a start. If they can be satisfied with the treatment they get, the money they make, and, above all, with the water they can draw from a convenient tap, they will be the best possible propagandists of the co-operative scheme, and our future difficulty may lie more in the selection of the best farmers among applicants.

A small 40-saw gin run by a steam engine, and a hand press have been ordered, and will, it is hoped, be in operation next season. In this way the purity of the seed supplied from Daudawa can be ensured.

Sierra Leone.

The Government have recently issued a report summarizing the work carried out by the Agricultural Department in the last three years with a view to establishing the cultivation of

cotton in Sierra Leone. The chief conclusions are that cotton of the Allen type should not be sown in the early rains, as it matures too rapidly. Moreover, in the climatic conditions prevailing in the country the crop is extraordinarily liable to attack by insect and fungoid pests, and soils must therefore be above the average fertility to produce sufficiently healthy plants. When sown at the end of the rains Allen's cotton without manure will produce yields of 200/300 lbs. seed cotton per acre.

Work is being carried out on the selection of a more hardy type of Allen's, and at the same time selection work is also being done on the local Quande variety, which has been favourably reported on by brokers. Owing to the conditions of native cultivation it is extremely difficult to obtain pure seed of Quande, and the selection work is slow and difficult in consequence. The Agricultural Department hope that, given success in their selection work on these two varieties, they may be able to establish a cross which would be well suited to conditions in Sierra Leone.

In 1926, Allen seed was only issued to the Chiefs for late sowing, and about 1,500 lbs. were distributed in the Pendembu, Konno and Kennema districts.

Gold Coast.

At the request of the Governor, the Director of Agriculture has prepared a comprehensive scheme for the promotion of cotton growing in two different parts of the Colony (*a*) in the Trans-Volta area of Togoland and (*b*) in the Northern Territories.

In the former area cotton growing for export on a small scale is already established, and the proposals now include the erection of a ginnery, the free distribution of seed from Nigeria, and a price guaranteed to the grower by the Government.

In the Northern Territories it is intended to distribute free seed sufficient for 1,000 acres. This seed will also be obtained

from Nigeria. A ginnery is to be established at Tamale, and experimental work on cotton will be carried on there. It is understood that the two schemes will involve a capital expenditure of approximately £16,000, and an annual expenditure of £4,500.

The Government recognise that in the Northern Territories at all events the scheme can only be economically sound if the best quality cotton is grown, on account of the long distance to the coast. A development of the motor lorry services would be of assistance in providing further transport facilities.

Cyprus.

The Government have renewed their request to the Corporation to send an expert to advise on the extension of cotton cultivation in the island. As stated in this Report last year, however, any increase in the area devoted to the crop appears to be dependent on irrigation by wells, and the Corporation are awaiting the Government's report on the trial borings that are now being made; this information is required especially for the districts which are reported to be suitable for cotton, so far as the soil and other factors are concerned. If the results show that a satisfactorily large area can be developed by means of the increased supply of water, the question of the provision of an expert and of the establishment of an experiment station, as suggested by the Governor, will be sympathetically considered.

The Triumph cotton seed which the Corporation secured from America at the request of the Agricultural Department, did well last season, the yield being nearly 1,500 lbs. of seed cotton per acre, as compared with 850 lbs. from local seed.

Ceylon.

It will be recollected that Mr. G. R. Hilson, of the Indian Agricultural Service, visited Ceylon last year at the request of the Government, to confer with the Director of Agriculture

on the possibilities of extending cotton cultivation. One of the suggestions made as a result of Mr. Hilson's visit was that efforts, should be made to induce the native to adopt a proper system of crop rotation, and to cultivate the same land in consecutive years. With this object in view arrangements have now been made to grant to a cultivator who has sown cotton on a one-acre plot for a second season an additional two acres adjoining his first clearing. If he carries out a regular rotation on this area for five years, he is then to be entitled to claim that the land should be settled on him. In all such cases cereals and cotton are to form the main rotations.

Further experimental work has been carried out at the Cotton Station at Ambalantota, and it is understood that two other centres will be established in Hambantota. These will chiefly be devoted to work on cotton and rotation crops. The Department of Agriculture have also under consideration the question whether an experimental station should be started at Vavunia to encourage cotton cultivation in the Northern Province. Despite a shortage of rain, the Director of Agriculture reported in January that the cotton in the Hambantota area was looking healthy, and that the scheme for promoting consolidation of cotton cultivation referred to above was attracting the attention of progressive agriculturists.

The Agricultural Department have re-considered the question of appointing a Specialist for the cotton work immediately, though they foreshadow the possibility of requiring a plant breeder in a year or two.

Fiji.

The total crop harvested in Fiji from the 1925-26 crop amounted to 122 bales of Sea Island cotton. The 1926-27 crop was seriously affected by drought which necessitated much replanting. The Government have paid advances of 4d., 3d., 2d., and 1d. per lb. of seed cotton for different grades, and the crop is ginned and marketed by the Government, who propose, before paying any balance

to the cultivators over and above the advances made on seed cotton, to deduct certain sums in order to pay the interest on the necessary finance and to repay the cost of the ginneries and the expenditure involved in establishing and running the experiment station which has recently been started. Payments will be spread over a number of years and will not be enforced by the Government unless it is considered that the season has been good enough to enable the grower to obtain a fair return from his crop over and above the deductions that have been made for sinking fund and interest.

Mr. Anson, the Corporation's Cotton Specialist attached to the Fiji Government, has sent in a progress report on the season 1925-26. This report appeared in the April issue of the *Empire Cotton Growing Review.* An experiment station has been established in the Sigatoka District in Viti Levu, some five miles from the Government Station. Mr. Anson hoped to have been able to have found a site for the experiment farm nearer to the Government Station, but was unable to secure a suitable area.

Variety tests have been carried out with strains of Sea Island, Meade, Kidney Cotton, Pima, and a hybrid probably derived from a cross between Sea Island and Kidney Cotton. The Pima seed failed to germinate, although it was re-sown twice; otherwise germination was very good. Time of planting, spacing and thinning tests have also been carried out, and a report on the results will be received in due course.

Mr. Anson reports that although most of the cotton districts in the Islands have shown signs of slight attack by pink bollworm, no great damage was done. All possible precautions will have to be taken, however, to keep this pest under control, and the practice of sunning the seed on iron sheets before distributing it to growers will be continued. A certain amount of damage was also done by the tip worm, stainers, leaf hoppers, and the harlequin bug.

Papua and New Guinea.

The Corporation regret that they have been unable to find a suitably qualified officer to fill the post of Cotton Specialist for Papua and New Guinea for the period of two years suggested by the Australian Government.

In Mr. Evans' report on his visit to these islands, which was published in the *Empire Cotton Growing Review*, reference was made to a Kidney Cotton found by Mr. Evans on Karkar Island. The special feature of this cotton is that it grows in an area of unusually heavy rainfall for cotton, and appears to be more or less immune to the attack of stainers. Mr. Evans brought home samples of lint which were favourably reported on both by the brokers and by the spinners who tested the samples. In the belief that this cotton might prove useful for breeding purposes in countries which are subject to heavy rainfall, the Corporation have been endeavouring to obtain seed from the Department of Agriculture of New Guinea. Unfortunately, the land where the cotton was found has been sold and the cotton trees uprooted. The Director of Agriculture hopes, however, that he may still be able to obtain a small quantity of seed of this variety. When the parcel of seed comes to hand it will be sent to the Corporation's Research Station in Trinidad for trial.

Mr. Evans also made some selections of a type of cotton in the Markham Valley, New Guinea, which appears to be a cross between Kidney Cotton and Sea Island. These selections were examined at the Shirley Institute, and the seed was sent to Mr. Anson, the Corporation's cotton specialist in Fiji, where Mr. Evans thought conditions might prove suitable for growing this type, and where Mr. Anson reports that they are doing well.

Research.

A year ago it was reported that the staff of the Corporation's Research Station in Trinidad had just been appointed,

and the erection of their houses and the laboratories was nearing completion. The equipment of the laboratories was still proceeding during the latter part of last year, but the staff had lost no time in beginning work. The programmes of the Genetics Department and of the Physiology Department were very carefully considered by the Research Station Sub-Committee, who were of the opinion that they were perhaps somewhat too ambitious, and on their recommendation the Heads of the Departments were informed by the Executive Committee that they were not necessarily expected to carry out too vast a programme, but were at liberty to select for prior investigation those subjects which they considered to be of first importance. The Committee further considered that it would be inadvisable for the programmes to be laid down too definitely, inasmuch as it might well be found necessary to vary them as the work proceeded.

It is too early yet to expect reports on the results of completed experiments, but discussions are taking place with the Heads of the Departments regarding the preparation of short memoranda setting out in non-technical language the aim and objects of the work that is going on, so that members of the Corporation may gain an insight into this important side of the work.

In addition to the fundamental research work that is being carried out at Trinidad, the Corporation's experiment stations in different parts of the Empire are doing extremely valuable work on the investigation of local practical problems that require to be solved in the several countries in which they arise. Such problems include the breeding, by selection, of the type of plant best suited to local climatic conditions, methods of insect pest control, experiments to determine which crops form the best rotations with cotton, methods of preventing soil erosion by rainstorms. The work that has been and is being done in all these directions is described in the volume "Reports received from Experiment Stations, 1925-26," a copy of which was sent in March last to all members of the Corporation.

A memorandum by the Director, giving a brief account of the manner in which the funds allocated by the Corporation for research work are being utilised, is circulated separately with this Report. That memorandum, together with the collected reports from experiment stations mentioned above, gives a comprehensive survey of the numerous directions in which work is being undertaken, while the paragraphs which here follow, bring the matter up to date from the time when those documents were written.

As regards the special work carried out for the Corporation during the past year at Institutions in this country, there have been changes in the staff at Manchester University in the Mycological Department, but the work on cotton fungi has been kept going and a paper has been published dealing with the staining of cotton from Nyasaland. A member of the staff has visited the cotton belt of America, where he was able to collect material of the chief fungoid and bacterial diseases of cotton, which will be used in future investigations in Manchester.

In the Entomological Department of the University a line of work in connection with attacks on cotton by thrips has been begun, after consultation with the Entomological Department of the Sudan Government. The work has, so far, confirmed the views held by the Government Entomologists that epidemic attacks of thrips, such as occur each year in the Gezira, can be minimised by heavier watering of cotton plants. The explanations which had been put forward by earlier workers to account for the controlling action on thrips of heavy watering have not been borne out by these experiments, and a new explanation will be put forward. Investigations are being carried out relating to the precise nature of the lesions on cotton caused by attacks of thrips, and a research student in cotton entomology has been awarded a travelling Fellowship by the University in order that he may proceed to Egypt this summer to study the question under field conditions.

It is hoped shortly to begin an investigation in conjunction with Mr. King, the Corporation's Cotton Entomologist in Nyasaland, with a view to discovering, if possible, what is the attractant principle in cotton buds and leaves for the red bollworm moth.

At the Imperial College of Science and Technology, work is also being carried out on cotton staining fungi and on the cotton wilt fungus. The Physiology Department, at the request of the Corporation, has kindly consented to undertake a comprehensive investigation into the treatment of cotton seed with strong sulphuric acid. It is generally accepted that such treatment promotes earlier germination, but the results obtained by some of the Corporation's officers have tended to show that this is not the effect with seeds from plants which had been subject to the attack of stainers. It is thought that a full investigation of the action will clear up such points and be of great service generally to cotton growers in all countries.

The School of Agriculture, Cambridge, is at present conducting a test for the Corporation which is illustrative of the ramifications into which the problems of cotton growing inevitably lead. In Nyasaland it has been found by the Corporation's staff that (*a*) a suitable rotation is essential to the production of cotton, especially as being the most effective method of control of the red bollworm; (*b*) bulrush millet is probably the best rotation crop in that country. Before it is possible, however, to advocate the cultivation of this grain on a large scale by natives, it is necessary to investigate its market value when exported. The School of Agriculture at Cambridge have accordingly consented to carry out extensive scientific tests on the value of bulrush millet as a feed for pigs and poultry.

At the Rothamsted Experimental Station, Dr. Crowther, after working for some months on soil investigations at the Gezira Research Farm in the Sudan, is continuing his experiments on the biochemistry of the nitrogen in samples of soil

sent home from the Gezira. He is also working on the statistical interpretation of the results of various experiments as carried out at the Gezira Research Farm. Another experiment that is being carried out, which was suggested by Dr. Crowther's Sudan visit, is an attempt to measure the rate of capillary movement of water in soil at its normal moisture content. Attention is also being paid to simple standardised methods of characterising soils. Comparison of soils of different origin is necessary in order that information on soils in any cotton-growing or similar area may be utilised in other areas; at the same time, it is recognised that to be of general value only the simplest analytical methods should be employed.

In the hope that this Report will reach many scientific agriculturists working on cotton, the Council take this opportunity of inviting them to send home to the Corporation problems relating to the diseases of cotton or to similar matters for investigation in this country, where the staffs of one or other of the Institutions named will gladly give them their whole-hearted attention, with a view to ascertaining their cause and suggesting, if possible, a practical remedy or solution.

The Research Sub-Committee of the Imperial Conference recommended that an Imperial Agricultural Research Conference should be held. The suggestion has been adopted, and the Conference will begin on October 4. The Director is a member of the Organising Committee, and the Secretary has been asked to serve on the Agenda Sub-Committee. It is hoped that at the Conference experts in all branches of agriculture from all parts of the Empire will be able to benefit by an exchange of views on their several problems. Any of the Corporation's staff who may be on leave will, it is hoped, receive invitations to attend.

Finally, members of the Corporation will be gratified to learn that the Imperial Conference, 1926, on the recommenda-

tion of their Research Special Sub-Committee, passed the following resolution:—

> "The Conference notes with pleasure the success attending the activities of the Empire Cotton Growing Corporation, and commends to the favourable notice of the respective Governments the steps which the Corporation is taking to co-operate with the Administrative and Agricultural Departments concerned in the promotion of cotton growing within the Empire."

Studentships.

Of the seven senior students elected for the year 1925-26, one is in the employment of the Sudan Plantations Syndicate, two have returned to service under the Department of Agriculture for the Union of South Africa, one has been appointed as Assistant on the Corporation's staff in Nyasaland, one is now Assistant Mycologist in Ceylon, and one has been receiving a further year's specialised instruction under the Corporation's Plant Breeder in the Sudan.

For the year 1926-27, eleven senior students and six juniors were elected out of 65 applicants. Ten of the seniors are spending their studentship year at the Imperial College of Tropical Agriculture, Trinidad, while one is being trained under Mr. Ducker at the Experiment Station in Nyasaland. Three of the junior students are at Cambridge, two at the South-Eastern Agricultural College, Wye, and one at the Rothamsted Experimental Station.

Members of the Corporation will be glad to know that satisfactory and even enthusiastic reports have been received from Directors of Agriculture and others on former Students of the Corporation now at work in different Colonies.

The Colonial Office Scheme for awarding annually a number of post-graduate scholarships to men who desire to enter the Colonial Agricultural Services, which follows closely the lines adopted by the Corporation's Studentship Scheme, is

now in operation. The Scheme should effect an improvement in the qualifications of agricultural officers, and the Corporation, therefore, hope to be able in future to reduce the number of Studentships offered by them, possibly to such a limit as will enable them merely to maintain the supply of thoroughly well trained scientific and agricultural officers necessary for their own service.

For the year 1927-28 the Executive Committee have authorised the offer of a maximum of twelve Studentships in this country, and possibly one or two in South Africa if suitable candidates are recommended by Mr. Milligan.

The Imperial College of Tropical Agriculture, Trinidad.

Last year the Council called attention to the important work which the College would be capable of accomplishing for the benefit of tropical crops if it could be adequately equipped for its work by greatly increased financial support. Last autumn the Colonial Office set up a Committee to consider the steps necessary to place the college on a sound financial footing, and appointed Mr. W. Howarth a member of it. After a careful examination of the position, the Committee reported that a capital sum of £42,000 was necessary to put the College on a satisfactory basis. The Executive took into consideration that the College not only afforded facilities for training the holders of the Corporation's Studentships, but also the fact that their efforts to extend cotton-growing can only wholly succeed if an improvement is effected in tropical agriculture generally. In this work the College is capable of playing a part of the greatest importance. Having regard to these considerations, the Executive decided to make a grant to the College at the rate of £1 for every £1 contributed by the Empire Marketing Board up to a maximum of £21,000. To this arrangement the latter Board has agreed.

Dr. Leake, the Principal of the College, has been obliged to return to this country on sick leave, and with the approval

of the Corporation, the Governing Body have appointed Mr. G. Evans, lately a member of the Corporation's staff, as Acting Principal during Dr. Leake's absence.

Transport.

The Corporation's three experimental vehicles have continued transporting cotton in Northern Nigeria this season, particularly in those areas in which there is a shortage of donkey transport and which motor lorries do not tap.

During the past 12 months the difficulties which are inevitable in experimental work have been experienced. Almost all, however, have been due to mechanical details of design in both bogie and track, and, as such, are capable of alteration, and can undoubtedly be overcome. For these reasons they have provided most valuable information to the inventors and manufacturers.

The authorities are now satisfied that the tracks do very little damage to the roads under normal conditions of soil and climate, but it has been found that a particular type of soil, under certain climatic conditions, adheres to the metal tracks, with the result that the road cuts up very badly. Soil of this type and in this condition of viscosity due to moisture and temperature is not met with in this country.

Another point about which the Transport Sub-Committee are inclined to revise their opinion is that, if a half-track vehicle is to be efficient and if the strain and wear on the track are to be fair, the speed of the vehicle must be low, that is to say from 5 to 10 m.p.h. It follows, therefore, that if half-track vehicles are to carry loads at economic rates, such loads must be considerably greater than at present. If this view is accepted the road maker and bridge builder are concerned. Bridges must be strong enough to take these larger vehicles, and their number must be reduced to a minimum,

paved fords being used as much as possible, while the vehicles should be made so that they can go through at least three feet of water.

As far as the smaller (i.e., 1 to 2 tonners) half-track vehicles are concerned, it would seem, judging from the experience gained in the past twelve months, that rubber tracks are more satisfactory than metal ones. It is doubtful, however, whether they would maintain this advantage if the size of the vehicles were increased, because as a metal track is made larger, some of the present difficulties would be diminished.

In the autumn of 1926 two driver mechanics, one from Roadless Traction Co., and one from the Citroen Kegresse Co., were sent out at the joint expense of the Corporation and their respective companies. These men thoroughly overhauled the vehicles, and reported that, generally speaking, their condition was satisfactory.

As mentioned in last year's Report, the producer-gas plant designed by the Lorry Maintenance Co. has been fitted to an ordinary four-wheeled Guy lorry. Preliminary tests having been made by the Lorry Maintenance Co., the lorry was sent up to the Guy Motor Works at Wolverhampton, and further accurate bench tests were taken. The first of these, taken when the gas was made with anthracite, showed a distinct loss of power. Messrs. Guy Motors, Ltd., however, were not discouraged by these tests, and felt confident that this particular disadvantage could be overcome. Further tests made with native-made Nigesian charcoal have proved that this form of fuel is better than anthracite, a most satisfactory result in view of the comparative ease with which charcoal can be obtained in most parts of Africa. Messrs. Guy Motors, Ltd., report that, in the hands of an unmechanical and not particularly skilled driver, the vehicle has been carrying from $2\frac{1}{2}$ to 3 tons over a distance of about 1,900 miles on hard roads with a consumption of 2 lbs. of charcoal per mile. Unfortunately, up to the present, it has not been possible to obtain sufficient charcoal from Nigeria to make conclusive tests. The Nigerian Government are sending several samples to this country, and it is hoped before long

to be able to compare them, and not only to test the lorry exhaustively, but also to report on the type of charcoal giving the best result.

At the request of the Colonial Office, the Sub-Committee have prepared a memorandum on the recent developments in mechanical transport, and on the experiments made by the Corporation, to be submitted to the Colonial Office Conference which is now taking place, and at which nearly every African Colony and Protectorate will be represented either by its Governor or its Chief Secretary. This memorandum will be printed by the Colonial Office, and copies will be circulated to members of the Corporation.

The Sub-Committee have emphasised the fact that their aim is to discover some form of transport which will reduce the cost per ton-mile from the present charges of 1s. or 1s. 6d. to 6d. or less. They point out that this result will be achieved sooner or later, and that the sooner funds are available for research and experiment the sooner will satisfactory results be obtained; that up to the present the Corporation is almost the only body which has financed experiments, and that they cannot be expected to continue such costly work for an indefinite period in view of their increasing expenses in connection with the direct encouragement of cotton growing in the Empire. They therefore urge the desirability of creating some inter-colonial body with inter-colonial funds at its disposal to deal with every aspect of mechanical transport, research and experiment.

In this connection it should be mentioned that at the invitation, and with the encouragement of, the Sudan Government, the Managing Director of the Roadless Traction Co. Ltd. has visited the Sudan during the past winter, and has definitely recommended the development of certain areas in which rain-grown cotton can be produced by the use of a road train capable of travelling along existing unmetalled roads with a load of about 100 tons. Whether such a large scale experiment can be carried out is mainly a question of finance.

Spinning Tests.

The facilities which the Corporation have been able to obtain for the carrying out of spinning tests on small samples through the courtesy of the Federation of Master Cotton Spinners' Associations and various firms of spinners, and for securing brokers' reports on the samples through the kindness of the Liverpool Cotton Association, are clearly greatly appreciated by Directors of Agriculture and others engaged in cotton growing. This year over 100 samples have been sent to the Corporation either for brokers' reports or for spinning tests or for both purposes. The countries from which these samples have been sent include the Union of South Africa (eight samples), Tanganyika (twenty-three), Nigeria (eleven), the Sudan (eight), Cyprus (seven), Nyasaland (six), Uganda (six), Northern Rhodesia (two), and Kenya (one). In addition, New Guinea sent sixteen small samples of seed cotton for brokers' report on the lint, and Tanganyika thirteen samples, the results of a spacing experiment for examination by the British Cotton Industry Research Association. It has been decided to alter slightly the arrangements that have been in force during the last two-and-a-half years, with a view to standardising the procedure and securing more readily that the brokers' valuations and the spinning tests are carried out by firms who habitually handle the class of cotton with which each sample appears to compare most closely. With this object each sample is first sent to the Liverpool Cotton Association, the President of which kindly decides which of their members can most advantageously be asked to report on the cottons. The brokers' report and the sample are then sent to the British Cotton Industry Research Association, whose Spinners' Committee select a firm who deal with this particular type of cotton, and they are asked to carry out the spinning test. A standard mixing is spun alongside each sample or series of samples to act as a control. Before forwarding the sample to the spinner, the Research Association withdraws a small quantity in order that a determination may be made of the

measurable characters of the hairs, and the spinner is also asked to forward to the Association a small quantity of the control mixing, in order that similar determinations may be made on it for the sake of comparison with the samples upon which a report is sought.

The brokers' report and the result of the spinning test are despatched to the sender of the sample as soon as the test is completed. The determination of the measurable characters takes some little time, and the results of these are forwarded later. It is hoped that this procedure will diminish the time which it has taken in the past for the sender of a sample to receive such a report on it as will enable him to determine whether further work on that particular selection or type will be advantageous.

The Corporation are glad to have this opportunity of acknowledging the hearty co-operation of the Research Association in the conduct of these tests as well as that of the spinners and brokers who are so kind as to examine and test the samples.

Provident Fund and Insurance Scheme for the Staff Abroad.

The Board of Trustees, on the recommendation of Council, have approved a scheme for establishing a Provident Fund and a scheme for the insurance of members of the Corporation's staff abroad. In their decision to suggest this action to the Council, the Executive Committee were influenced by the fact that the Corporation have trained, and are continuing to train, and take into their service on short term agreements carefully picked young men with special qualifications who are living in an environment where the great majority of men of like age and of similar attainments are Government servants on the permanent staff, receiving definite small increments of pay annually, and the prospect of a pension after a specified number of years of service. In such circumstances it is only

natural that the Corporation's officers should look for salaries and for security of tenure of their posts at least equal to those which they would secure from other employers; and there is a distinct possibility of their being attracted either to Government service, or to that of plantation companies engaged in cotton growing, or the culivation of other tropical products, such as tobacco or rubber. The Corporation would thus lose men whom they have specially selected and trained, unless by means of a scheme such as that which has now been established, the terms of continued employment under the Corporation are made fully as satisfactory as those which they could obtain elsewhere.

After prolonged and very careful examination of alternative proposals, a combined Provident Fund and Insurance Scheme has been adopted. In general, only those members of the staff abroad will be eligible to participate who are neither already in receipt of a pension, nor have received compensation in lieu thereof, but each application to join the Scheme will be considered on its merits, provided that the applicant has completed two year's continuous service with the Corporation. The full details of the Scheme would occupy too much space for inclusion in this Report, but the following particulars constitute a rough summary.

The Provident Fund will consist of the member's own contributions deducted from his salary on a sliding scale according to the amount of that salary. To these sums thus deducted the Corporation will add compound interest at the rate of 4 per cent. per annum. The Insurance Scheme comprises an Endowment Insurance Policy maturing in 15 years' time from the date upon which the member enters the scheme, or on his earlier death. The premiums will be paid by the Corporation. The Scheme provides for benefits to members on their voluntary retirement after a certain number of years of service, on their retirement from ill-health, or to their dependents on death. At the same time it allows the Corporation freedom to terminate a member's contract at any time,

and to return to him his contributions to the Provident Fund with the interest thereon. It is hoped that the arrangements whereby the Provident Fund to which the member alone contributes, and the Insurance Scheme running side by side will provide a degree of flexibility which should meet all contingencies.

The Scheme came into force on April 1st, 1927, and special arrangements were made in the case of members of the staff who had completed two years' service prior to that date.

EMPIRE COTTON CROPS FOR EIGHT YEARS 1919-26, EXCLUDING INDIA.

IN BALES OF 400 lbs.

Country.	1918–19.	1919–20.	1920–21.	1921–22.	1922–23.	1923–24.	1924–25.	1025–26.	1926–27. Estimates.
(1) Anglo-Egyptian Sudan	15,997	23,160	30,519	24,074	28,306	47,652	44,912	121,131	131,750 (1)
(2) Gold Coast	52	—	61	49	15	93	1,132	1,218	* (2)
(3) Nigeria	17,500	16,200	30,000	15,096	16,811	25,694	39,137	47,909	18,000 (3)
(4) Uganda	36,530	47,694	81,365	48,290	88,046	128,604	196,038	180,859	130,000 (4)
(5) Kenya	100	100	500	417	1,200	1,653	2,250	2,046	1,500 (5)
(6) Nyasaland	2,591	2,026	4,615	5,422	4,036	6,873	7,718	4,976	4,000 (6)
(7) Northern Rhodesia ..	56	35	100	80	102	500	379	495	363 (7)
(8) Southern Rhodesia ..	—	—	—	—	—	1,650	4,907	6,803	1,250 (8)
(9) Tanganyika	—	—	7,500	7,327	7,175	11,434	18,793	21,674	24,550 (9)
(10) Union of South Africa and Swaziland ..	1,911	2,737	2,923	2,740	6,523	8,730	16,936	20,381	* (10)
(11) West Indies	6,137	6,205	4,833	4,113	5,254	4,290	4,184	5,671	* (11)
(12) Queensland	31	38	792	3,140	9,344	11,850	14,318	7,208	4,300 (12)
(13) Cyprus	1,000	3,325	2,687	2,547	1,505	2,233	3,397	3,320	* (13)
(14) Malta	315	343	266	582	193	118	573	782	507 (14)
(15) Iraq	—	—	60	60	300	1,100	2,400	2,540	3,000 (15)
(16) Fiji	—	—	—	—	83	153	123	122	788 (16)
(17) Ceylon	—	—	—	—	49	324	121	261	250 (17)
	82,220	101,863	166,221	113,937	168,942	252,951	357,318	427,396	
		Percentage Increase 24·0.	*Percentage Increase* 63·1.	*Percentage Decrease* 31·4.	*Percentage Increase* 48·2.	*Percentage Increase* 49·7.	*Percentage Increase* 41·2.	*Percentage Increase* 19·6	

* Estimates not yet received.

THE EMPIRE COTTON GROWING CORPORATION.

REVENUE AND EXPENDITURE ACCOUNT. Year ended March 31st, 1927.

	£ s. d.	£ s. d.
To GENERAL EXPENDITURE ABROAD.		
Nigeria—		
Salaries and Passages	1,869 5 9	
Labour and Materials	3,865 6 7	
Nyasaland—		
Salaries and Passages	2,713 3 0	
Local Travelling, Labour and Materials ...	387 11 10	
Cotton Experiment Stations	521 17 1	
Australia—		
Salaries and Passages	1,395 9 8	
One Year's Grant to Commonwealth Government towards cost of maintenance of Experiment Stations	3,000 0 0	
South Africa—		
Salaries and Passages	6,876 5 2	
Local Travelling, Labour and Materials ...	2,029 17 8	
Senior Cotton Specialist. Part payment in compensation for loss of pension rights ...	1,250 0 0	
Amount advanced to Spelonken (Transvaal) Cotton Syndicate, Ltd.	8,645 1 7	
Sudan—		
Salaries and Passages	2,155 11 2	
Local Travelling and Sundries	147 18 4	
West Indies—		
Salaries and Expenses at Experiment Station, St. Vincent	228 1 7	
Grant to Imperial College of Tropical Agriculture, Trinidad	21,000 0 0	
Fiji—		
Salaries	602 8 4	
Uganda—		
Salaries	134 5 11	
Implements	11 4 10	
Swaziland—		
Salaries	1,499 6 2	
Local Travelling, Labour and Materials ...	1,067 7 1	
Rhodesia (Northern)—		
Salaries and Passages	1,062 3 3	
Cotton Prizes	10 11 0	
Rhodesia (Southern)—		
Salaries and Passages	2,075 19 6	
Implements	24 1 1	

	£ s. d.	£ s. d.	£ s. d.
By COTTON LEVY			73,992 17 7
,, CONTRIBUTION BY THE LIVERPOOL COTTON ASSOCIATION LIMITED			500 0 0
,, INTEREST AND DIVIDENDS—			
From Investments representing the Capital-Grant	39,992 16 8		
From Investments made from Surplus Income	5,009 12 0		
			45,002 8 8
,, BANK INTEREST			1,443 10 0
,, SALES OF REPORTS			17 12 9

Share (one-third) of erection costs of machinery for three ginneries	75 4 2		
Tour of Inspection in South Africa and Rhodesia, cost to date	561 13 9		
		63,209 14 6	
„ STUDENTSHIPS, including Passages, Travelling and Grants for Books	5,858 0 10		
One year's contribution to the Imperial College of Tropical Agriculture, Trinidad	500 0 0		
		6,358 0 10	
„ RESEARCH—			
Grants to Institutions at Home	4,000 0 0		
Trinidad Station—			
Amount remitted to Trinidad for the Purchase of Land, and the Building and Equipping of Research Laboratories and Staff Houses	4,829 6 7		
Purchases in this country of Apparatus and Equipment	2,677 19 9		
Cultivation and sundry other recurrent expenses	2,202 10 0		
Salaries and Passages	3,905 11 4		
		17,615 7 8	
„ MECHANICAL TRANSPORT EXPERIMENTS—			
Cost of Two Trailers and Sundry Materials	1,004 10 4		
Salaries, Passages and Expenses	1,828 18 0		
		2,833 8 4	
„ OFFICE STAFF SALARIES		9,058 2 8	
„ RENT		700 0 0	
„ GAS, ELECTRICITY, AND TELEPHONE		86 4 4	
„ UPKEEP OF OFFICES		140 7 6	
„ TRAVELLING EXPENSES—MEMBERS OF COUNCIL AND COMMITTEES	542 0 5		
STAFF	163 19 10		
		706 0 3	
„ LEGAL AND ACCOUNTANCY CHARGES		680 2 10	
„ PRINTING AND STATIONERY		710 17 4	
„ PRINTING AND PUBLISHING "THE EMPIRE COTTON GROWING REVIEW" (INCLUDING EDITOR'S SALARY)		1,165 8 11	
„ SUNDRY EXPENSES		377 8 4	
„ DEPRECIATION OF FURNITURE AND FITTINGS ...		43 14 8	
		103,684 18 2	
„ BALANCE (BEING EXCESS OF REVENUE OVER EXPENDITURE FOR THE YEAR)		17,271 10 10	
		£120,956 9 0	£120,956 9 0

THE EMPIRE COTTON GROWING CORPORATION.

BALANCE SHEET, March 31st, 1927.

LIABILITIES.

	£ s. d.	£ s. d.
CAPITAL GRANT from Imperial Government ...		978,715 0 0
SUNDRY CREDITORS (including £10,000 balance of Grant to the Imperial College, Trinidad) ...		13,374 5 10
Reserve for possible liability for Income Tax ...		35,552 13 0
REVENUE AND EXPENDITURE ACCOUNT—		
Balance at March 31st, 1926	184,186 7 5	
Excess of Income over Expenditure, Year ended March 31st, 1927	17,271 10 10	
		201,457 18 3

NOTE.—There is a contingent liability arising out of a Guarantee for £53,000, given by the Corporation in respect of the Bank overdraft of The Premier Cotton Estates of South Africa, Ltd.

£1,229,099 17 1

ASSETS

	£ s. d.	£ s. d.
FURNITURE AND FITTINGS AT COST	666 11 0	
Less Depreciation to date	272 19 2	
		393 11 10
INVESTMENTS AT COST—		
Capital Grant	978,048 9 0	
Revenue and Expenditure Account	192,183 8 9	
		1,170,231 17 9
SUNDRY DEBTORS		494 7 8
CASH AT BANKERS—		
Williams Deacon's Bank, Ltd., Manchester	13,671 16 7	
Williams Deacon's Bank, Ltd., London ...	2,179 10 10	
British Overseas Bank	4,461 15 0	
		20,313 2 5
CASH IN HAND—London and Abroad		2,114 4 5
British Overseas Bank—Special Deposit Account to meet possible liability for Income Tax ...		35,552 13 0
NOTE.—The Assets of the Corporation also include the following, the cost of which has been charged to Revenue :—		
1. Lorries and Trailers for Transport Experiment	4,296 3 4	
2. Ginning Machinery for Three Ginneries in Southern Rhodesia (One-third of outlay)	10,775 7 3	
3. Amount advanced to Spelonken (Transvaal) Cotton Syndicate, Ltd., on account of Ginnery and Working Capital	28,737 6 8	
4. Cost to date of Land, Buildings and Equipment of Trinidad Research Station ...	21,597 4 3	
	65,406 1 6	

£1,229,099 17 1

We have audited the above Balance Sheet and the Revenue and Expenditure Account, and certify that all our requirements as Auditors have been complied with. We report to the members that in our opinion the accounts are properly drawn up so as to exhibit a true and correct view of the state of the Corporation's affairs, as shown by the books of the Corporation.

(Signed) DAVID SMITH, GARNETT & CO.,
CHARTERED ACCOUNTANTS, MANCHESTER.

April 21st, 1927.

Waterlow & Sons Limited, London Wall, London.